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UTILITY  
PATENT APPLICATION  
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(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. CDP0700

First Inventor or Application Identifier Cary D. Perttunen

Title METHODS, ARTICLES AND APPARATUS FOR ADVERTISING  
BASED ON AN ATTRIBUTE OF A COMPUTER NETWORK RESOURCE

Express Mail Label No. EK898293002US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ \* Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)

2. ☒ Specification [Total Pages 38]  
(preferred arrangement set forth below)  
- Descriptive title of the Invention  
- Cross References to Related Applications  
- Statement Regarding Fed sponsored R & D  
- Reference to Microfiche Appendix  
- Background of the Invention  
- Brief Summary of the Invention  
- Brief Description of the Drawings (if filed)  
- Detailed Description  
- Claim(s)  
- Abstract of the Disclosure

3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 2]

4. Oath or Declaration [Total Pages 2]  
a. ☒ Newly executed (original or copy)  
b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))  
(for continuation/divisional with Box 16 completed)  
i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting  
inventor(s) named in the prior application,  
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

5. ☐ Microfiche Computer Program (Appendix)

6. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)  
a. ☐ Computer Readable Copy  
b. ☐ Paper Copy (identical to computer copy)  
c. ☐ Statement verifying identity of above copies

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
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ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))

8. ☐ 37 C.F.R. § 3.73(b) Statement of Power of Attorney  
(when there is an assignee)

9. ☐ English Translation Document (if applicable)

10. ☐ Information Disclosure Statement (IDS)/PTO-1449 [Copies of IDS Citations]

11. ☐ Preliminary Amendment

12. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)

13. ☒ \* Small Entity Statement(s) [Statement filed in prior application, Status still proper and desired (PTO/SB/09-12)]

14. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)

15. ☒ Other: CHECK

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:  
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: \_\_\_\_\_  
Prior application information: Examiner \_\_\_\_\_ Group / Art Unit: \_\_\_\_\_  
For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label [ ] or ☒ Correspondence address below  
(Insert Customer No. or Attach bar code label here)

Name Cary D. Perttunen

Address 11764 Raintree Court

City Shelby Twp. State MI Zip Code 48315

Country USA Telephone Fax

Name (Print/Type) Cary D. Perttunen Registration No. (Attorney/Agent) 38,578

Signature Cary D. Perttunen Date JULY 31, 2000

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**STATEMENT CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR**

Docket Number (Optional)  
CDP0700

Applicant, Patentee, or Identifier: Cary D. Perttunen

Application or Patent No.: \_\_\_\_\_

Filed or Issued: \_\_\_\_\_

Methods, Articles and Apparatus for Advertising  
Title: BASED ON AN ATTRIBUTE OF A COMPUTER NETWORK RESOURCE

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- ☒ the specification filed herewith with title as listed above.  
☐ the application identified above.  
☐ the patent identified above.

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Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Cary D. Perttunen

NAME OF INVENTOR

NAME OF INVENTOR

NAME OF INVENTOR

Cary D. Perttunen

Signature of inventor

Signature of inventor

Signature of inventor

JULY 31, 2000

Date

Date

Date

CDP0700

METHODS, ARTICLES AND APPARATUS FOR ADVERTISING BASED  
ON AN ATTRIBUTE OF A COMPUTER NETWORK RESOURCE

Technical Field

5

The present invention relates to methods, articles and apparatus for advertising.

Background of the Invention

10

Many Internet portals provide a search engine with which a user may initiate an Internet search. The search engine returns a list of Web pages based upon a search expression received from the user.

15

Some search engines display a similarity value for each Web page in the list. Each similarity value numerically indicates a degree of correlation or relevance between its corresponding Web page and the search expression.

20

Oftentimes, the Web pages in the list are sorted based on the similarity values. By sorting the Web pages in this manner, the list presents highly-relevant Web pages before lesser-relevant Web pages.

25

Some Internet portals provide directories of Web pages. These directories provide a tree-like structure of categories and subcategories within which Web pages are classified.

30

DoubleClick, Inc. provides various Internet advertising solutions. These solutions include providing advertising for an Internet portal at

www.AltaVista.com. Advertising on a search results page may be targeted based upon a keyword in a search expression submitted to www.AltaVista.com.

## 5 Brief Description of the Drawings

The present invention is pointed out with particularity in the appended claims. However, other features are described in the following detailed  
10 description in conjunction with the accompanying drawings in which:

FIG. 1 is a block diagram of an embodiment of a system for providing advertising; and

15 FIG. 2 is a block diagram of another embodiment of a system for providing advertising.

## Detailed Description of Preferred Embodiments

Improved methods, articles and apparatus for  
20 advertising are disclosed herein. Advertising for a Web resource is targeted and/or accounted for based upon an advertiser-usable variable specific to the Web resource. The advertiser-usable variable is provided by a referring Web resource having a hyperlink to the  
25 Web resource. The advertiser-usable variable may comprise either a similarity value between the Web resource and a search expression, a similarity value between the Web resource and the referring Web resource, or a tree-defined attribute of the Web  
30 resource, for example.

After the hyperlink is user-selected from the referring Web resource, an advertisement is selected from a plurality of advertisements based on the advertiser-usable variable. The advertisement is  
5 provided to the client node to display with the Web resource.

In this way, different referring Web resources providing a hyperlink to the Web resource may provide different values of the advertiser-usable variable  
10 specific to the Web resource. For example, one referring Web resource may use one tree to define a tree-defined attribute of the Web resource, and another referring Web resource may use a different tree to define a tree-defined attribute of the Web resource.  
15 Thus, different ones of the advertisements may be displayed with the Web resource depending on which referring Web resource's hyperlink was user-selected.

The present disclosure also contemplates a single referring Web resource which provides varying values of  
20 the tree-defined attribute of the Web resource. For example, the value of the tree-defined attribute of the Web resource may be dependent upon a search expression which identified the Web resource. Thus, different ones of the advertisements may be displayed with the  
25 Web resource for different searches which identified the Web resource.

FIG. 1 is a block diagram of an embodiment of a system for providing advertising. A client node 10 generates and sends a request message 14 to a content  
30 node 12 via a computer network (not specifically

illustrated) in accordance with a communication protocol. Examples of the client node 10 include, but are not limited to, a client computer system and a personal digital assistant. Examples of the content node 12 include, but are not limited to, a server computer system. Examples of the computer network include, but are not limited to, an internet, an intranet and an extranet. Examples of the protocol include, but are not limited to, HTTP (hypertext transfer protocol) and WAP (wireless application protocol).

The request message 14 requests a resource, such as a Web resource, from the content node 12. In response to the request message 14, the content node 12 generates and sends one or more response messages to the client node 10 via the computer network. The one or more response messages provides a Web resource 16 to the client node 10 via the computer network.

The Web resource 16 comprises a plurality of user-selectable hyperlinks. For purposes of illustration and example, the user-selectable hyperlinks include a first user-selectable hyperlink 20 to a first Web resource available from a first content node 22, a second user-selectable hyperlink 24 to a second Web resource available from a second content node 26, and a third user-selectable hyperlink 30 to a third Web resource available from a third content node 32. Each of the content nodes 22, 26 and 32 may be embodied by a respective one of three different server computer systems, for example. The content nodes 22, 26 and 32

may have any physical location relative to the content node 12. For example, each of the content nodes 22, 26 and 32 may be either proximate to or distantly located from the content node 12. Similarly, each of the  
5 content nodes 22, 26 and 32 may have any physical location relative to others of the content nodes 22, 26 and 32. For example, each of the content nodes 22, 26 and 32 may be located in geographically diverse locations. Although illustrated with three user-  
10 selectable hyperlinks, the Web resource 16 may comprise any number of user-selectable hyperlinks to a plurality of Web resources in general.

To identify the plurality of Web resources, the content node 12 may perform a search based on a search  
15 expression received from the client node 10. The search expression may be user-entered using an input device such as a keyboard, a touch screen, a touch pad or a voice input device associated with the client node 10. The search expression may contain one or more  
20 words in the form of either a Boolean search expression or a natural language search expression, for example. The search expression may include information from a plurality of user-enterable fields to limit the scope of the search. The search expression may include an  
25 image or encoded audio.

The search performed via the content node 12 yields search results comprising the plurality of Web resources, the plurality of Web resources being a subset of a larger set of Web resources. The content  
30 node 12 may use scripting code to provide, within the

Web resource 16, the user-selectable hyperlinks associated with the search-identified Web resources.

The Web resource 16 further comprises a plurality of advertiser-usable variables within at least one script 34. Each of the at least one script 34 may include script code either directly within the Web resource 16, or within a separate file called by computer program code within the Web resource 16. Examples of programming languages for the at least one script 34 include, but are not limited to, JavaScript and VBScript.

For purposes of illustration and example, the advertiser-usable variables include one or more advertiser-usable variables 36 specific to the first Web resource, one or more advertiser-usable variables 40 specific to the second Web resource, and one or more advertiser-usable variables 42 specific to the third Web resource. Each of the one or more advertiser-usable variables 36, 40 and 42 has a corresponding value usable by an advertisement server node 44 to select advertising content to display with its corresponding Web resource. The advertisement server node 44 may be embodied by a server computer system, for example. The advertisement server node 44 may have any physical location relative to the content nodes 12, 22, 26 and 32.

In the case of the Web resource 16 providing search results, the one or more advertiser-usable variables 36 may indicate a similarity value between the search expression and the first Web resource, the



one or more advertiser-usable variables 40 may indicate a similarity value between the search expression and the second Web resource, and the one or more advertiser-usable variables 42 may indicate a

5 similarity value between the search expression and the third Web resource. Each similarity value indicates a degree of similarity, relevance or correlation between the search expression and its corresponding Web resource. Preferably, each similarity value numerically

10 indicates the degree of similarity, relevance or correlation. For example, each similarity value may comprise an integer from 0 to 100. Alternatively, each similarity value may qualitatively indicate the degree of similarity, relevance or correlation. For example,

15 each similarity value may indicate either high similarity, moderate similarity or low similarity. Regardless of whether the similarity value is quantitative or qualitative, it is preferred that the similarity value be capable of indicating a plurality

20 of different levels of similarity. More preferably, the similarity value is capable of indicating at least three different levels of similarity.

Alternatively, for both search and non-search applications, the content node 12 may determine a tree

25 which relates the plurality of Web resources. In this case, each of the one or more advertiser-usable variables 36, 40 and 42 may include a value defined by the tree. The content node 12 may use various computer-readable data structures to represent the tree

in a computer-readable form using a computer-readable medium.

Before proceeding, a review of trees and graph-related terminology is provided. A graph is definable  
5 by a set of nodes and a set of edges joining or associating different pairs of distinct nodes. The edges in the graph may be either directed or undirected.

Alternative terminology may be used to describe  
10 the graph. Examples of synonyms of "node" include, but are not limited to, "vertex" and "state". Examples of synonyms of "edge" include, but are not limited to, "arc" and "link". Therefore, the herein-disclosed methods, articles, apparatus, and examples should not  
15 be limited by the selected terminology used to describe the graph.

A first node is said to be adjacent to a second node if there is an edge from the first node to the second node. A path is definable by a sequence of  
20 nodes wherein each consecutive pair of nodes in the sequence is adjacent.

A tree is a graph having a unique path from a designated node, called a root node, to each of its other nodes. If the tree is undirected, then any of  
25 its nodes can be designated to be the root node. An undirected tree can be made into a directed tree by directing all edges away from the designated root node.

Each node in a directed tree, except for the root node, is a child node of a unique parent node from  
30 which an edge is directed thereto. Nodes having the

same parent node are called siblings. Nodes of a directed tree with no children are called leaf nodes. Nodes having at least one child are called internal nodes. The level number of a node is defined as the  
5 number of edges in the path between the node and the root node. The height of the tree is the largest level number of any node.

If each internal node of a rooted tree has  $m$  children, the tree is called an  $m$ -ary tree. If  $m=1$ ,  
10 the tree is unary. If  $m=2$ , the tree is binary. If  $m=3$ , the tree is ternary.

Each of the Web resources is represented by a corresponding node of the tree. Relationships between Web resources are represented by edges in the tree.  
15 Examples of edge-represented relationships between items include, but are not limited to, a degree of similarity, a hyperlink, an associative link, a state of being an element of, a state of being contained in, a state of being associated with, a state of reporting  
20 to, a state of being in a category, a state of depending from, and a state of being a reply to.

The tree may be unary to define a browsing sequence for the Web resources. In other cases, the tree is non-unary, i.e. the tree has at least one  
25 internal node with two or more child nodes. In some cases for a non-unary tree, the tree may have more leaf nodes than a number of child nodes emanating from its root node. Regardless of whether the tree is unary or non-unary, it is preferred that the tree has a height

of at least two. In some cases, the tree may have a height of three or greater.

For Web resources comprising computer-readable messages, an edge in the tree may indicate that one message is a reply to another message. Thus, a reply message is a child of its parent message, and two reply messages to the same parent message are siblings. Each base message, i.e. each message that begins a new thread, may have an associated edge to a root node in the tree. If a search is performed, the root node may represent a Web resource associated with the search expression. Regardless of whether a search is performed, the root node may represent a Web resource associated with a discussion group of which the messages are elements.

In some embodiments, the content node 12 provides the tree by determining an optimum path tree based upon a first plurality of similarity values between the search expression and the Web resources, and a second plurality of similarity values between pairs of the Web resources. The optimum path tree indicates a respective optimum path between the search expression and each of the plurality of Web resources.

The optimum path between the search expression and a Web resource has an optimum function value of similarity values between the search expression and the Web resource. Examples of the function whose optimum value dictates the optimum path include, but are not limited to, a sum of similarity values between the search expression and the Web resource, and a product

of similarity values between the search expression and the Web resource. To determine an optimum product of similarity values, an additive optimum path algorithm may be performed on a logarithm of the similarity values. For example, if the similarity values are numerical values between 0% and 100%, then an additive minimum path algorithm may be performed on a negative logarithm of the non-zero similarity values, e.g. -  
log(similarity value), to determine a maximum product of similarity values.

As is known in the art of network algorithms, examples of algorithms to compute the shortest paths include, but are not limited to, Dijkstra's algorithm and Floyd's algorithm. Those having ordinary skill can review shortest path algorithms on pp. 123-127 of A. Tucker, Applied Combinatorics, Second Edition, John Wiley & Sons, 1984, which is hereby incorporated by reference into this disclosure.

Alternatively, the content node 12 may provide the tree by determining a spanning tree based upon the first plurality of similarity values and the second plurality of similarity values. Examples of the spanning tree include, but are not limited to, an optimum spanning tree such as a minimum spanning tree, and a search tree.

The optimum spanning tree has an optimum function value of similarity values. Examples of the function whose optimum value dictates the optimum spanning tree include, but are not limited to, a sum of similarity values, and a product of similarity values. To

determine an optimum product of similarity values, an additive optimum spanning tree algorithm may be performed on a logarithm of the similarity values.

As is known in the art of network algorithms, examples of algorithms to compute a minimum spanning tree include, but are not limited to, Kruskal's algorithm and Prim's algorithm. Those having ordinary skill can review minimum spanning trees on pp. 127-131 of A. Tucker, Applied Combinatorics, Second Edition, John Wiley & Sons, 1984, which is hereby incorporated by reference into this disclosure.

Examples of the search tree include, but are not limited to, a depth-first search spanning tree, a breadth-first search spanning tree, or a best-first search spanning tree. Those having ordinary skill can review search trees on pp. 80-122 of A. Tucker, Applied Combinatorics, Second Edition, John Wiley & Sons, 1984, which is hereby incorporated by reference into this disclosure.

Each of the one or more advertiser-usable variables 36, 40 and 42 may indicate a level number of its corresponding Web resource within the tree. For example, the one or more advertiser-usable variables 36 may indicate a level number of the first Web resource within the tree, the one or more advertiser-usable variables 40 may indicate a level number of the second Web resource within the tree, and the one or more advertiser-usable variables 42 may indicate a level number of the third Web resource within the tree. Each

level number may be indicated numerically by an integer, e.g. 1, 2, 3, etc.

Alternatively, each of the one or more advertiser-usable variables 36, 40 and 42 may indicate whether its  
5 corresponding Web resource is an internal resource of the tree or a leaf resource of the tree. For example, the one or more advertiser-usable variables 36 may indicate that the first Web resource is an internal resource of the tree, and the one or more advertiser-usable variables 40 may indicate that the second Web  
10 resource is an internal resource of the tree. As another example, the one or more advertiser-usable variables 36 may indicate that the first Web resource is an internal resource of the tree, and the one or more advertiser-usable variables 40 may indicate that  
15 the second Web resource is a leaf resource of the tree. As a further example, the one or more advertiser-usable variables 36 may indicate that the first Web resource is a leaf resource of the tree, and the one or more advertiser-usable variables 40 may indicate that the  
20 second Web resource is a leaf resource of the tree.

As another alternative, each of the one or more advertiser-usable variables 36, 40 and 42 may be based on the ancestry of its corresponding Web resource  
25 within the tree. The one or more advertiser-usable variables 36 may be based on which of the Web resources having a predetermined level number is an ancestor of the first Web resource in the tree, the one or more advertiser-usable variables 40 may be based on which of  
30 the Web resources having the predetermined level number

is an ancestor of the second Web resource in the tree,  
and the one or more advertiser-usable variables 42 may  
be based on which of the Web resources having the  
predetermined level number is an ancestor of the third  
5 Web resource in the tree. Of particular interest is  
where the predetermined level number is one.

Preferably, each of the one or more advertiser-  
usable variables 36, 40 and 42 also identifies its  
corresponding Web resource. For example, the one or  
10 more advertiser-usable variables 36 may include a  
computer address of the first Web resource, the one or  
more advertiser-usable variables 40 may include a  
computer address of the second Web resource, and the  
one or more advertiser-usable variables 42 may include  
15 a computer address of the third Web resource. Examples  
of each computer address include, but are not limited  
to, a uniform resource locator (URL), a uniform  
resource name (URN), a uniform resource identifier  
(URI) and an internet protocol (IP) address.  
20 Alternatively, the one or more advertiser-usable  
variables 36 may include a first non-address identifier  
of the first Web resource, the one or more advertiser-  
usable variables 40 may include a second non-address  
identifier of the second Web resource, and the one or  
25 more advertiser-usable variables 42 may include a third  
non-address identifier of the third Web resource.

In some embodiments, the at least one script 34  
includes two advertiser-usable variables for each  
hyperlink: one identifying the Web resource  
30 corresponding to the hyperlink, and another indicating



either the similarity value or the tree-defined value. Alternatively, a single advertiser-usable variable may both identify the Web resource and indicate either the similarity value or the tree-defined value.

5       The Web resource 16 includes computer program code to generate a request message, such as an advertisement request message 46 or another request message. Based on the computer program code, the client node 10 generates and sends the advertisement request message 10 46 to the advertisement server node 44 via the computer network. The advertiser request message 46 requests a resource, such as a Web resource, from the advertisement server node 44. In response to the advertisement request message 46, the advertisement 15 server node 44 generates and sends one or more response messages to the client node 10 via the computer network. The one or more response messages may provide an advertisement resource 50 to the client node 10 via the computer network. Examples of the advertisement 20 resource 50 include, but are not limited to, visible advertisements such as a banner advertisement, a button advertisement, a badge advertisement, a text link advertisement, a rich media advertisement and a pop-up window advertisement, and audible advertisements. The 25 advertisement resource 50 is displayed with the Web resource 16 by the client node 10. It is noted that providing the advertisement resource 50 is optional.

Regardless of whether the advertisement resource 50 is provided, the one or more response messages 30 facilitate reading the plurality of advertiser-usable

variables 36, 40 and 42, and providing at least one cookie 52 for the client node 10 before any of the user-selectable hyperlinks 20, 24 and 30 have been user-selected from the Web resource 16 using the client  
5 node 10. The at least one cookie 52 stores the advertiser-usable variables 36', 40' and 42'.

A single cookie may store the all of the advertiser-usable variables 36', 40' and 42'. In this case, for example, the single cookie may store a string  
10 comprising all of the advertiser-usable variables 36', 40' and 42' and a delimiter to separate the variables. Alternatively, multiple cookies may store the advertiser-usable variables 36', 40' and 42'. In this case, for example, a first cookie may store the one or  
15 more advertiser-usable variables 36', a second cookie may store the one or more advertiser-usable variables 40', and a third cookie may store the one or more advertiser-usable variables 42'.

In general, the at least one cookie 52 may be  
20 either readable or unreadable by the content nodes 12, 22, 26 and 32. Typically, however, the at least one cookie 52 is unreadable by the content nodes 12, 22, 26 and 32.

After the at least one cookie 52 has been provided  
25 to the client node 10, any of the user-selectable hyperlinks 20, 24 and 30 may be user-selected from the Web resource 16 using the client node 10. For purposes of illustration and example, consider the user selecting the first user-selectable hyperlink 20 from  
30 the Web resource 16 using the client node 10. In

response thereto, the client node 10 generates and sends a request message to the content node 22 via the computer network. The request message requests a resource, such as a Web resource, from the content node 22. In response to the request message, the content node 22 generates and sends one or more response messages to the client node 10 via the computer network. The one or more response messages provides a Web resource 54 to the client node 10 via the computer network.

The Web resource 54 includes computer program code to generate an advertisement request message 56. Based on the computer program code, the client node 10 generates and sends the advertisement request message 56 to the advertisement server node 44 via the computer network. Based on the advertisement request message 56, the one or more advertiser-usable variables 36' associated with the Web resource 54 are retrieved from the at least one cookie 52. Either the advertisement request message 56 or a variable within a script of the Web resource 54 may identify the Web resource 54 to facilitate the one or more advertiser-usable variables 36' being distinguished from the other variables 40' and 42' using the herein-disclosed Web resource identifiers in the at least one cookie 52.

Preferably, the one or more advertiser-usable variables 36' are retrieved by or otherwise communicated to the advertisement server node 44. In this case, the advertisement server node 44 selects an advertisement from a plurality of advertisements based

on the one or more advertiser-usable variables 36'.  
Alternatively, the one or more advertiser-usable  
variables 36' are retrieved by the client node 10,  
which selects an advertisement from a plurality of  
5 advertisements based thereon.

The advertisement may be selected using one or  
more targeting criteria for the one or more advertiser-  
usable variables 36'. For example, some of the  
advertisements may have a targeting criterion to enable  
10 advertising only with Web resources having a similarity  
value within a prespecified range. An advertisement  
may have a respective numerical range of acceptable  
similarity values (e.g. from 85 to 100), or a  
respective qualitative range of acceptable similarity  
15 values (e.g. high similarity). In these cases, higher  
billing rates may be charged for advertising with Web  
resources having higher similarity values (all other  
factors being equal).

As another example, some of the advertisements may  
20 have a targeting criterion to enable advertising only  
with Web resources having a level number within a  
prespecified range. An advertisement may have a  
respective numerical range of acceptable level numbers  
(e.g. only a level number of 1, only a level number of  
25 2, level numbers from 3 to 4, or level numbers of 3 and  
greater). In some cases, higher billing rates may be  
charged for advertising with Web resources having lower  
level numbers (all other factors being equal).  
Optionally, the tree defining the level number is

unary, such as a browsing sequence for the Web resources.

As a further example, some of the advertisements may have a targeting criterion to enable advertising only with Web resources which are internal resources of a tree, and others may have a targeting criterion to enable advertising only with Web resources which are leaf resources of the tree. In some cases, higher billing rates may be charged for advertising with internal resources than for leaf resources (all other factors being equal).

As a still further example, some of the advertisements may have a targeting criterion to enable advertising only with Web resources having an ancestor resource, at a predetermined level number in the tree, which meets at least one criterion. In this case, for example, higher billing rates may be charged for advertising with Web resources having a higher-similarity-value ancestor resource at the predetermined level number (all other factors being equal).

In the case of the advertisement server node 44 selecting the advertisement, the advertisement server node 44 generates and sends one or more response messages to provide an advertisement resource 60 to the client node 10 via the computer network. Examples of the advertisement resource 60 include, but are not limited to, visible advertisements such as a banner advertisement, a button advertisement and a pop-up window advertisement, and audible advertisements. The

advertisement resource 60 is displayed with the Web resource 54 by the client node 10.

Optionally, the advertisement server node 44 may update a data structure associated with the  
5 advertisement resource 60 based on the one or more advertiser-usable variables 36'. The data structure may include a count which is incremented based on the one or more advertiser-usable variables 36'. The count may indicate a number of impressions of the  
10 advertisement resource 60 for a particular range of an advertiser-usable variable. Alternatively, the count may indicate a number of click-throughs of the advertisement resource 60 for a particular range of an advertiser-usable variable. Each particular range may  
15 comprise a single value or a plurality of values.

The data structure is used to generate an advertising report associated with the advertisement resource 60. The advertising report may include a breakdown of a number of impressions and/or click-  
20 throughs for each particular range an advertiser-usable variable.

Similar acts are performed in response to user-selection of the second user-selectable hyperlink 24 from the Web resource 16 using the client node 10. In  
25 particular, (a) a request message is generated and sent to the content node 26 via the computer network, (b) the content node 26 provides to the client node 10 via the computer network a second Web resource including computer program code to generate an associated  
30 advertisement request message, (c) the client node

generates and sends the advertisement request message to the advertisement server node 44, (d) the advertising request message associated with the second Web resource is received by the advertisement server node 44, (e) the one or more advertiser-usable variables 40' is retrieved from the at least one cookie 52, (f) an advertisement from the plurality of advertisements is selected based on the one or more advertiser-usable variables 40', and (g) and the advertisement is provided to display with the second Web resource by the client node 10. Similar acts are performed in response to user-selection of the third user-selectable hyperlink 30 from the Web resource 16 using the client node 10.

FIG. 2 is a block diagram of another embodiment of a system for providing advertising. The embodiment of FIG. 2 differs from the embodiment of FIG. 1 in that the advertisement server node 44, upon receiving the advertisement request message 46, reads the plurality of advertiser-usable variables 36, 40 and 42, and stores corresponding advertiser-usable variables 36", 40" and 42" in a database 70 before any of the user-selectable hyperlinks 20, 24 and 30 have been user-selected from the Web resource 16 using the client node 10.

Further, the advertisement server node 44 optionally provides at least one cookie 72 for the client node 10 before any of the user-selectable hyperlinks 20, 24 and 30 have been user-selected from the Web resource 16 using the client node 10. The at

least one cookie 72 stores an identification code 74. The database 70 also stores an identification code 74" corresponding to the identification code 74. The identification codes 74 and 74" are used to associate  
5 the advertiser-usable variables 36", 40" and 42" in the database 70 to the client node 10. The database 70 may use various computer-readable data structures to store the identification code 74" and the advertiser-usable variables 36", 40" and 42" in a computer-readable form  
10 using a computer-readable medium.

In general, the at least one cookie 72 may be either readable or unreadable by the content nodes 12, 22, 26 and 32. Typically, however, the at least one cookie 72 is unreadable by the content nodes 12, 22, 26  
15 and 32.

Alternatively, the identification code 74 may not be included in at least one cookie 72 and/or may not be provided by the advertisement server node 44. In these cases, the identification code 74 may be pre-stored in  
20 the client node 10 to uniquely identify the client node 10. In this case, the advertisement server node 44 may read the identification code 74 from the client node 10, and thereafter store the corresponding identification code 74" in the database 70 and  
25 associate the corresponding identification code 74" with the advertiser-usable variables 36", 40" and 42".

After the advertiser-usable variables 36", 40" and 42" have been stored in the database 70, any of the user-selectable hyperlinks 20, 24 and 30 may be user-  
30 selected from the Web resource 16 using the client node



10. For purposes of illustration and example, consider the user selecting the first user-selectable hyperlink 20 from the Web resource 16 using the client node 10. In response thereto, the client node 10 generates and sends a request message to the content node 22 via the computer network. The request message requests a resource, such as a Web resource, from the content node 22. In response to the request message, the content node 22 generates and sends one or more response messages to the client node 10 via the computer network. The one or more response messages provides a Web resource 54 to the client node 10 via the computer network.

The Web resource 54 includes computer program code to generate the advertisement request message 56. Based on the computer program code, the client node 10 generates and sends the advertisement request message 56 to the advertisement server node 44 via the computer network. Based on the advertisement request message 56, the advertisement server node 44 uses the identification code 74 from the client node to retrieve one or more advertiser-usable variables 36" associated with the Web resource 54 from the database 70. Either the advertisement request message 56 or a variable within a script of the Web resource 54 may identify the Web resource 54 to facilitate the one or more advertiser-usable variables 36" being distinguished from the other variables 40" and 42" using the herein-disclosed Web resource identifiers in the database 70.

The advertisement server node 44 selects an advertisement from a plurality of advertisements based on the one or more advertiser-usable variables 36". The advertisement server node 44 generates and sends one or more response messages to provide the selected advertisement resource 60 to the client node 10 via the computer network. The advertisement resource 60 is displayed with the Web resource 54 by the client node 10.

Similar acts are performed in response to user-selection of either the second user-selectable hyperlink 24 or the third user-selectable hyperlink 30 from the Web resource 16 using the client node 10. Although not specifically illustrated, the database 70 typically stores identification codes and associated advertiser-usable variables for a plurality of different client nodes.

With reference to either FIG. 1 or FIG. 2, each of the client node 10, the content node 12, the content node 22, the content node 26, the content node 32 and the advertisement server node 44 may comprise one or more programmed computers. Each programmed computer may provide a particular functionality implemented using hardware and/or software and/or firmware.

Preferably, each programmed computer includes a processor responsive to a computer memory to perform a series of specifically identified operations dictated by a computer program. In this way, the computer program can cause the computer to act in a particular fashion.

Examples of the processor include, but are not limited to, a general purpose microprocessor, an application-specific integrated circuit (which may be either standard or custom), one or more discrete logic elements, a digital signal processor, one or more circuits, or any combination thereof. It is noted that the processor may be embodied by either a single processing unit or a plurality of processing units.

Examples of the computer memory include, but are not limited to, an electronic memory, a magnetic memory, an optical memory, and a magneto-optical memory. Examples of an electronic memory include, but are not limited to, a programmable electronic memory and a read-only, hard-wired electronic memory. Examples of a magnetic memory include, but are not limited to, a magnetic disk and a magnetic tape. The magnetic disk may be embodied by a magnetic floppy diskette or a magnetic hard drive, for example. Examples of an optical memory include, but are not limited to, an optical disk. The optical disk may be embodied by a compact disk or a DVD, for example. Regardless of its form, the computer memory may be either read-only, once-writable, or rewritable.

In general, the processor may be responsive to any data structures, computer programs, and signals encoded on a computer-readable medium to perform an embodiment of any of the herein-disclosed methods and examples. Examples of the computer-readable medium include, but are not limited to, computer-readable storage media and computer-readable communication media. Examples of

computer-readable storage media are described with reference to the computer memory. Examples of computer-readable communication media include, but are not limited to, an optical medium, an electronic medium, and an electromagnetic medium.

The client node 10 may cooperate in a client-server fashion with the advertisement server node 44 and the content nodes 12, 22, 26 and 32, for example. The client node 10 communicates with the advertisement server node 44 and the content nodes 12, 22, 26 and 32 in accordance with a communication protocol. Examples of the protocol include, but are not limited to, HTTP and WAP.

The client node 10 includes a display device to display Web resources and selected advertisement resources. Examples of the display device include, but are not limited to, a computer monitor, a television, a liquid crystal display, a cathode ray tube, and a gas plasma display.

The client node 10 receives user-initiated selections and other user input from one or more user input devices. Examples of input devices include, but are not limited to, a pointing device, a keyboard, and a voice input device. Examples of pointing devices include, but are not limited to, a mouse, a touchpad, a trackball, a joystick, a pointing stick and a touchscreen.

A selection of a hyperlink is detected in response to a user-initiated event. Examples of the user-initiated event include, but are not limited to, an on-

click event, a double-click event, a mouse-move event, a mouse-over event, a mouse-out event, a mouse-up event, and a key depression event. The display and the one or more user input devices facilitate user

5 interaction with the client node 10.

The client node 10 includes a transceiver to communicate with the computer network. Examples of the transceiver include, but are not limited to, a modem, a network interface, and a wireless transceiver.

10 It is noted that each of the herein-disclosed Web resources may include computer program code in a markup language such as hypertext markup language (HTML), wireless markup language (WML) or handheld device markup language (HDML). For example, some of the  
15 herein-disclosed Web resources may comprise World Wide Web pages.

It will be apparent to those skilled in the art that the disclosed inventions may be modified in numerous ways and may assume many embodiments other  
20 than the preferred forms specifically set out and described herein.

Accordingly, it is intended by the appended claims to cover all modifications which fall within the true spirit and scope of the present invention.

25 What is claimed is:

## Claims

1. A method comprising:

providing a Web resource to a client node via a  
5 computer network, the Web resource comprising a  
plurality of user-selectable hyperlinks including a  
first user-selectable hyperlink to a first Web resource  
and a second user-selectable hyperlink to a second Web  
resource, the Web resource further comprising a  
10 plurality of advertiser-usable variables within at  
least one script, the advertiser-usable variables  
including a first advertiser-usable variable specific  
to the first Web resource and a second advertiser-  
usable variable specific to the second Web resource.

15

2. The method of claim 1 further comprising  
performing a search based on a search expression to  
identify the plurality of Web resources, wherein the  
first advertiser-usable variable indicates a similarity  
20 value between the search expression and the first Web  
resource, and wherein the second advertiser-usable  
variable indicates a similarity value between the  
search expression and the second Web resource.

25 3. The method of claim 1 further comprising  
determining a tree which relates the plurality of Web  
resources, wherein the first advertiser-usable variable  
and the second advertiser-usable variable are defined  
by the tree.

30

4. The method of claim 3 wherein the first advertiser-usable variable indicates a level number of the first Web resource within the tree, and wherein the second advertiser-usable variable indicates a level number of the second Web resource within the tree.

5. The method of claim 3 wherein the first advertiser-usable variable indicates that the first Web resource is an internal resource of the tree, and wherein the second advertiser-usable variable indicates that the second Web resource is an internal resource of the tree.

6. The method of claim 3 wherein the first advertiser-usable variable indicates that the first Web resource is an internal resource of the tree, and wherein the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

7. The method of claim 3 wherein the first advertiser-usable variable indicates that the first Web resource is a leaf resource of the tree, and wherein the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

8. The method of claim 3 wherein the Web resources include a plurality of Web resources having a predetermined level number in the tree, wherein the first advertiser-usable variable is based on which of

the Web resources having the predetermined level number is an ancestor of the first Web resource in the tree, and wherein the second advertiser-usable variable is based on which of the Web resources having the  
5 predetermined level number is an ancestor of the second Web resource in the tree.

9. The method of claim 8 wherein the predetermined level number is one.

10

10. A method comprising:

reading a plurality of advertiser-usable variables within at least one script of a Web resource from a client node, the Web resource comprising a plurality of  
15 user-selectable hyperlinks including a first user-selectable hyperlink to a first Web resource and a second user-selectable hyperlink to a second Web resource, the advertiser-usable variables including a first advertiser-usable variable specific to the first  
20 Web resource and a second advertiser-usable variable specific to the second Web resource; and

providing at least one cookie for the client node before any of the user-selectable hyperlinks has been user-selected from the Web resource using the client  
25 node, the at least one cookie to store the first advertiser-usable variable and the second advertiser-usable variable.

11. The method of claim 10 further comprising,  
30 after the first user-selectable hyperlink has been



user-selected from the Web resource using the client node:

receiving a first advertising request associated with the first Web resource;

5 retrieving the first advertiser-usable variable from the at least one cookie;

selecting a first advertisement from a plurality of advertisements based on the first advertiser-usable variable; and

10 providing the first advertisement to display with the first Web resource.

12. The method of claim 11 further comprising, after the second user-selectable hyperlink has been  
15 user-selected from the Web resource using the client node:

receiving a second advertising request associated with the second Web resource;

retrieving the second advertiser-usable variable  
20 from the at least one cookie;

selecting a second advertisement from the plurality of advertisements based on the second advertiser-usable variable; and

providing the second advertisement to display with  
25 the second Web resource.

13. The method of claim 11 further comprising updating a data structure associated with the first advertisement based on the first advertiser-usable  
30 variable.

14. The method of claim 10 further comprising:  
receiving an advertising request associated with  
the Web resource, wherein said reading is performed in  
5 response to said receiving the advertising request.

15. The method of claim 10 wherein the first  
advertiser-usable variable indicates a similarity value  
between a search expression and the first Web resource,  
10 and wherein the second advertiser-usable variable  
indicates a similarity value between the search  
expression and the second Web resource.

16. The method of claim 10 wherein the first  
15 advertiser-usable variable and the second advertiser-  
usable variable are defined by a tree which relates the  
plurality of Web resources.

17. The method of claim 16 wherein the first  
20 advertiser-usable variable indicates a level number of  
the first Web resource within the tree, and wherein the  
second advertiser-usable variable indicates a level  
number of the second Web resource within the tree.

18. The method of claim 16 wherein the first  
25 advertiser-usable variable indicates that the first Web  
resource is an internal resource of the tree, and  
wherein the second advertiser-usable variable indicates  
that the second Web resource is an internal resource of  
30 the tree.

19. The method of claim 16 wherein the first advertiser-usable variable indicates that the first Web resource is an internal resource of the tree, and  
5 wherein the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

20. The method of claim 16 wherein the first advertiser-usable variable indicates that the first Web resource is a leaf resource of the tree, and wherein  
10 the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

21. The method of claim 16 wherein the Web resources include a plurality of Web resources having a predetermined level number in the tree, wherein the first advertiser-usable variable is based on which of the Web resources having the predetermined level number  
15 is an ancestor of the first Web resource in the tree, and wherein the second advertiser-usable variable is based on which of the Web resources having the predetermined level number is an ancestor of the second Web resource in the tree.  
20

25

22. The method of claim 21 wherein the predetermined level number is one.

23. A method comprising:

reading a plurality of advertiser-usable variables within at least one script of a Web resource from a client node, the Web resource comprising a plurality of user-selectable hyperlinks including a first user-selectable hyperlink to a first Web resource and a second user-selectable hyperlink to a second Web resource, the advertiser-usable variables including a first advertiser-usable variable specific to the first Web resource and a second advertiser-usable variable specific to the second Web resource; and

storing the first advertiser-usable variable and the second advertiser-usable variable at an advertisement server node before any of the user-selectable hyperlinks has been user-selected from the Web resource using the client node.

24. The method of claim 23 further comprising, after the first user-selectable hyperlink has been user-selected from the Web resource using the client node:

receiving a first advertising request associated with the first Web resource;

retrieving the first advertiser-usable variable from the advertisement server node;

selecting a first advertisement from a plurality of advertisements based on the first advertiser-usable variable; and

providing the first advertisement to display with the first Web resource.

25. The method of claim 24 further comprising,  
after the second user-selectable hyperlink has been  
user-selected from the Web resource using the client  
5 node:

receiving a second advertising request associated  
with the second Web resource;

retrieving the second advertiser-usable variable  
from the at least one cookie;

10 selecting a second advertisement from the  
plurality of advertisements based on the second  
advertiser-usable variable; and

providing the second advertisement to display with  
the second Web resource.

15

26. The method of claim 24 further comprising  
updating a data structure associated with the first  
advertisement based on the first advertiser-usable  
variable.

20

27. The method of claim 23 further comprising:  
receiving an advertising request associated with  
the Web resource, wherein said reading is performed in  
response to said receiving the advertising request.

25

28. The method of claim 23 wherein the first  
advertiser-usable variable indicates a similarity value  
between a search expression and the first Web resource,  
and wherein the second advertiser-usable variable

indicates a similarity value between the search expression and the second Web resource.

29. The method of claim 23 wherein the first  
5 advertiser-usable variable and the second advertiser-usable variable are defined by a tree which relates the plurality of Web resources.

30. The method of claim 29 wherein the first  
10 advertiser-usable variable indicates a level number of the first Web resource within the tree, and wherein the second advertiser-usable variable indicates a level number of the second Web resource in the tree.

31. The method of claim 29 wherein the first  
15 advertiser-usable variable indicates that the first Web resource is an internal resource of the tree, and wherein the second advertiser-usable variable indicates that the second Web resource is an internal resource of  
20 the tree.

32. The method of claim 29 wherein the first  
advertiser-usable variable indicates that the first Web resource is an internal resource of the tree, and  
25 wherein the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

33. The method of claim 29 wherein the first  
30 advertiser-usable variable indicates that the first Web

resource is a leaf resource of the tree, and wherein the second advertiser-usable variable indicates that the second Web resource is a leaf resource of the tree.

- 5           34. The method of claim 29 wherein the Web resources include a plurality of Web resources having a predetermined level number in the tree, wherein the first advertiser-usable variable is based on which of the Web resources having the predetermined level number
- 10 is an ancestor of the first Web resource in the tree, and wherein the second advertiser-usable variable is based on which of the Web resources having the predetermined level number is an ancestor of the second Web resource in the tree.

- 15           35. The method of claim 34 wherein the predetermined level number is one.

METHODS, ARTICLES AND APPARATUS FOR ADVERTISING BASED  
ON AN ATTRIBUTE OF A COMPUTER NETWORK RESOURCE

Abstract of the Disclosure

5

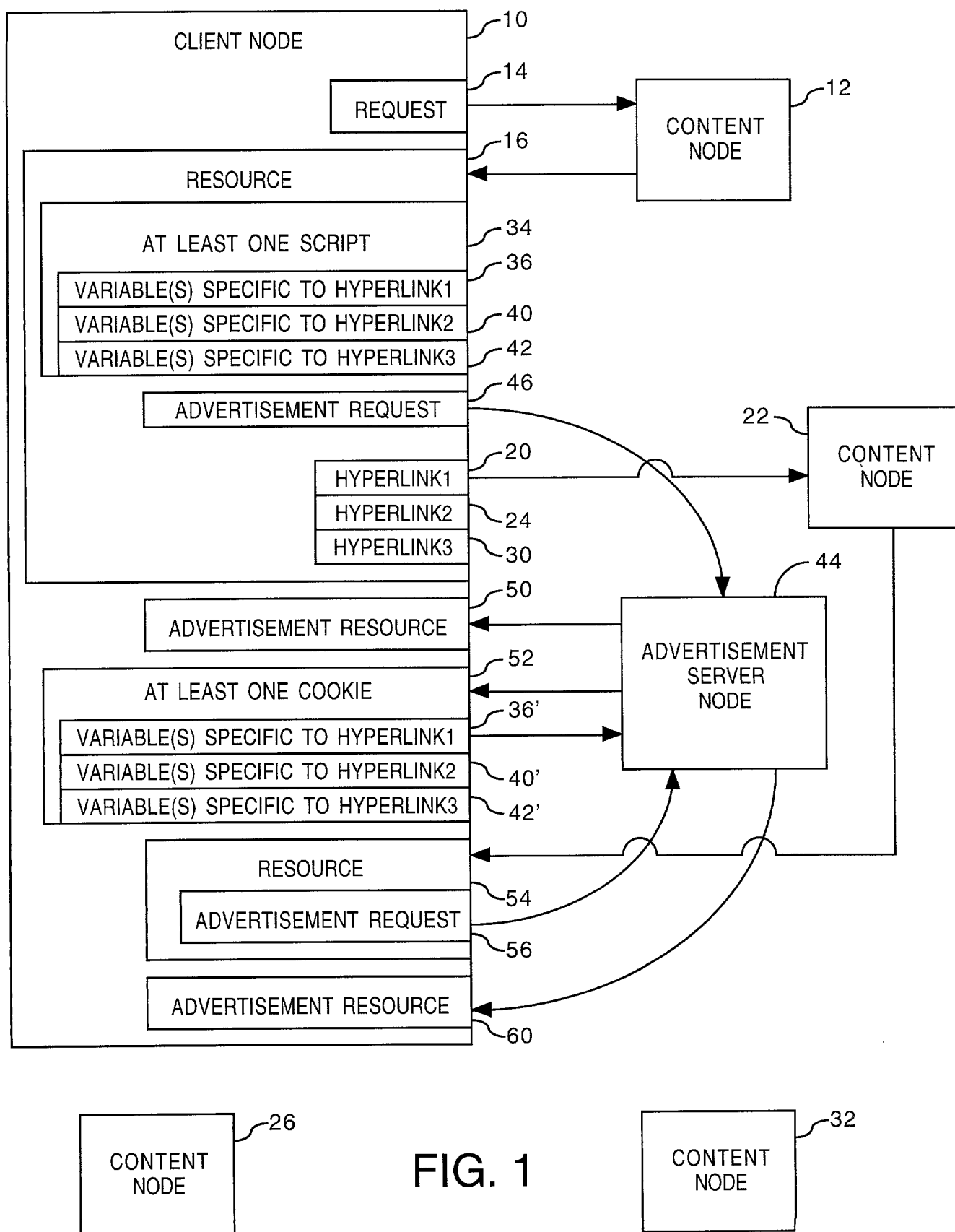
A Web resource comprising a plurality of user-selectable hyperlinks to a plurality of Web resources is provided to a client node via a computer network. The Web resource comprises a plurality of advertiser-usable variables within at least one script. The advertiser-usable variables include a first advertiser-usable variable specific to a first Web resource and a second advertiser-usable variable specific to a second Web resource. An advertisement server node reads the advertiser-usable variables and stores same either at the client node or at the advertisement node. After a first hyperlink is user-selected from the Web resource, the advertisement server node retrieves the first advertiser-usable variable corresponding to the first Web resource. An advertisement is selected from a plurality of advertisements based on the first advertiser-usable variable. The advertisement is provided to the client node to display with the first Web resource.

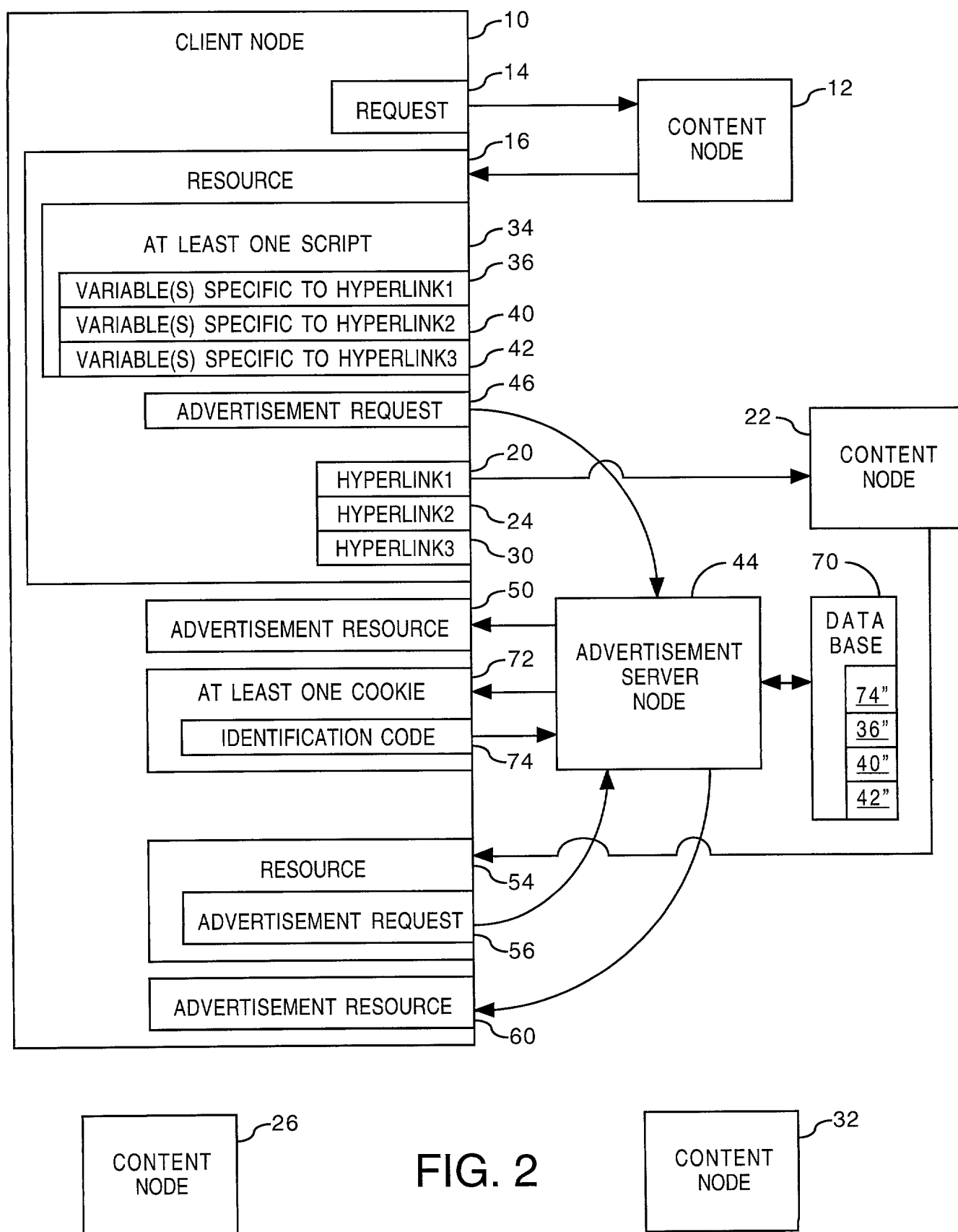
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	<b>First Named Inventor</b>	Perttunen
	<b>COMPLETE IF KNOWN</b>	
	<b>Application Number</b>	/
	<b>Filing Date</b>	
	<b>Group Art Unit</b>	
	<b>Examiner Name</b>	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHODS, ARTICLES AND APPARATUS FOR ADVERTISING  
BASED ON AN ATTRIBUTE OF A COMPUTER NETWORK RESOURCE

the specification of which (Title of the Invention)

☒ is attached hereto  
OR

☐ was filed on (MM/DD/YYYY) as United States Application Number or PCT International

Application Number and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

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[Page 1 of 2]

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U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

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Direct all correspondence to: ☐ Customer Number   OR ☒ Correspondence address below

Name	Cary D. Perttunen					
Address						
Address	11764 Raintree Court					
City	Shelby Twp.	State	MI	ZIP	48315	
Country	USA	Telephone			Fax	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned inventor

Given Name (first and middle (if any))		Family Name or Surname					
Cary D.		Perttunen					
Inventor's Signature	<i>Cary D. Perttunen</i>			Date	JULY 31, 2000		
Residence: City	Shelby Twp.	State	MI	Country	USA	Citizenship	USA
Post Office Address	11764 Raintree Court						
Post Office Address							
City	Shelby Twp.	State	MI	ZIP	48315	Country	USA

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